

REMARKS

By the foregoing Amendment, independent Claims 40, 46 and 67 are amended to further highlight novel aspects of the present invention, and dependent Claims 41, 43, and 57 are amended to correct informalities and provide conformance with the amended independent claims. Entry of the Amendment, and favorable consideration thereof, is earnestly requested. Claims 1-39 having been previously cancelled, Claims 40-67 are currently pending.

Independent Claim 46 has been rejected under 35 U.S.C. 102(b) as being anticipated by Wengert et al. (WO 97/06288A1). However, Applicant points out that Claim 46 has now been amended in a manner similar to which Claim 40 was previously amended, and which resulted in the Examiner no longer primarily relying on Wengert et al. as a basis for rejection.

More specifically, Claim 46 has been amended to require that active heating of the reactor chamber be accomplished by an elevated temperature of heated walls of the reactor chamber on all sides of the reactor chamber. Wengert et al. clearly does not disclose this feature. Rather, Wengert et al. discloses a CVD reaction chamber which is made entirely of quartz, which is transparent to light. Heating within the reaction chamber is accomplished by radiation emitted by lamps, which directly heat the substrate within the reaction chamber. Thus,

heating within the reaction chamber is caused by radiative heating of the lamps on the substrate, and not in any way by heated walls. To the extent that the walls of the reaction chamber of Wengert et al. are heated at all, such heating of the walls is caused indirectly by heating within the chamber. This is exactly the opposite of what is required by Claim 46, as amended, which instead requires that the reaction chamber be actively heated by the walls.

In view of the above amendments, Applicant anticipates that the rejection based primarily on Wengert et al. will be withdrawn. However, Applicant anticipates that rejections similar to those issued with respect to Claims 40 and 67 would be issued. Therefore, Applicant treats Claim 46 together with Claims 40 and 67 below.

Claims 67 stands rejected under 35 U.S.C. 103(a) as being unpatentable over Kordina et al. (US 5,792,257) in view of Crawley et al. (US 5,871,586) and Wengert et al. (WO 97/06288 A1). Claim 40 stands rejected under 35 U.S.C. 103(a) as being unpatentable over Kordina et al. in view of Crawley et al. and Wengert et al. and further in view of Burk (US 5,788,777). As mentioned above, in view of the above-discussed amendments to Claim 46, Applicant anticipates that similar rejections would be applied to Claim 46. Applicant respectfully asks the

Examiner to reconsider these rejections in view of the above Amendments and the below Remarks.

As discussed in the application as originally filed and in previous Responses filed by Applicant, one of the main goals of the present invention is to provide a system and method by which homoepitaxial or heteroepitaxial SiC and/or $\text{SiC}_x\text{Ge}_{1-x}$ ($0 \leq x \leq 1$) layers can be deposited very homogeneously and with high growth rates. This is achieved, in accordance with the present invention, by a very precise arrangement of components, arranged in a precise way, which result in a precise flow of gasses through the system. Claims 40, 46 and 67, all independent claims, have been amended to even more particularly point out Applicant's novel arrangement.

More specifically, all claims as amended require an actively heated flow channel reactor chamber, heating of the reactor chamber being accomplished by an elevated temperature of heated walls of the reactor chamber on all sides of the reactor chamber, a gas inlet which is actively cooled to a temperature well below process temperature that is present within the reactor chamber and which has an opening of the inlet extending transversely to a location of a front surface of a substrate, and a gas outlet, the gas inlet and the gas outlet providing for a stream of the reaction gasses that flows in a horizontal direction past the substrate holder.

All claims have been further amended to require an insulation segment comprising highly insulating temperature-resistant material disposed between and spatially separating the gas inlet and the reactor chamber, and to require that this precise claimed arrangement ensures that the gases flow in the horizontal direction within the gas inlet, across the insulation segment and through the reactor, and that a high horizontal temperature gradient within the gases exists across the insulation segment and substantially no horizontal temperature gradient within the gases exists within the reactor chamber. Applicant respectfully submits that these highlighted limitations are not disclosed, taught or suggested by the cited prior art, either when taken alone or in combination.

For example, while the references separately disclose an actively heated reaction chamber and an actively cooled inlet, none of the references discloses, teaches or suggests in any way an insulation segment comprising highly insulating temperature-resistant material disposed between and spatially separating the gas inlet and the reactor chamber. Kordina et al. discloses a reaction chamber, but does not disclose any pertinent information about an inlet or its connection to the reaction chamber. Crawley et al. discloses a reaction chamber and gas inlets, but does not disclose, teach or suggest any type of insulation segment disposed between and spatially separating the gas inlet and the reactor chamber. To the contrary, Crawley et al. discloses that the gasses flow directly from the gas inlets

(21, 24, 39) into the reactor chamber 5. Similarly, Burk also discloses a reaction chamber and a gas inlet, but also does not disclose, teach or suggest any type of insulation segment disposed between and spatially separating the gas inlet and the reactor chamber. Instead, Burk discloses that the gasses flow directly from the gas inlet (i.e., nozzle 36) into the reactor chamber 30.

Wengert et al. discloses a reaction chamber 130 and a gas inlet 156, but does not disclose, teach or suggest in any way an insulation segment comprising highly insulating temperature-resistant material disposed between and spatially separating the gas inlet and the reactor chamber. The only element that could even be argued to be disposed between the gas inlet and the reaction chamber is the o-ring seal 270 (see Figure 21). However, this o-ring seal clearly does not spatially separate the gas inlet and the reaction chamber, and Applicant respectfully submits that one skilled in the art would not consider this o-ring seal to be an insulation member. This is particularly true in view of the various other newly added claim limitations, namely that: the gases flow in the horizontal direction within the gas inlet, across the insulation segment and through the reactor chamber, and that a high horizontal temperature gradient within the gases exists across the insulation segment and substantially no horizontal temperature gradient within the gases exists within the reactor. Particularly, in Wengert et al., there being no insulating segment, there is no disclosure, teaching or suggestion

of a high temperature gradient within gasses as they flow across an insulation segment, and consequently there is no disclosure of substantially no horizontal temperature gradient within the gases within the reactor chamber. To the contrary, because of the lack of an insulating segment, cooled gasses within the cooled gas inlet 156 would exhibit a high temperature gradient within the reaction chamber 130 after they exit the cooled gas inlet 156.

Thus, as none of the cited prior art references discloses various elements required by all claims, as amended, Applicant respectfully submits that a combination of these references would still be missing these required elements.

Moreover, it is well settled that the mere fact that references *are capable of being* combined or modified does not render a resultant combination or modification obvious *unless the prior art also suggests the desirability of the combination or modification*. *In re Mills*, 916 F.2d 680, 682, 16 U.S.P.Q.2d 1430, 1432 (Fed. Cir. 1990) (Although a prior art device "may be capable of being modified to run the way the apparatus is claimed, there must be a suggestion or motivation in the reference to do so" in order for obviousness to exist). In the present case, Applicant respectfully submits that there is absolutely no suggestion in the prior art references which would lead one skilled in the art to supply the

above-discussed missing elements, and that the only disclosure, teaching or suggestion of these missing elements is found within the present application itself.

For the foregoing reasons, Applicant respectfully submits that all pending claims, namely Claims 40-67, are patentable over the references of record, and earnestly solicits allowance of the same.

Respectfully submitted,



Wesley W. Whitmyer, Jr., Reg. No. 33,558
Todd M. Oberdick, Reg. No. 44,268
ST. ONGE STEWARD JOHNSTON & REENS LLC
986 Bedford Street
Stamford, Connecticut 06905-5619
(203) 324-6155
Attorneys for Applicant